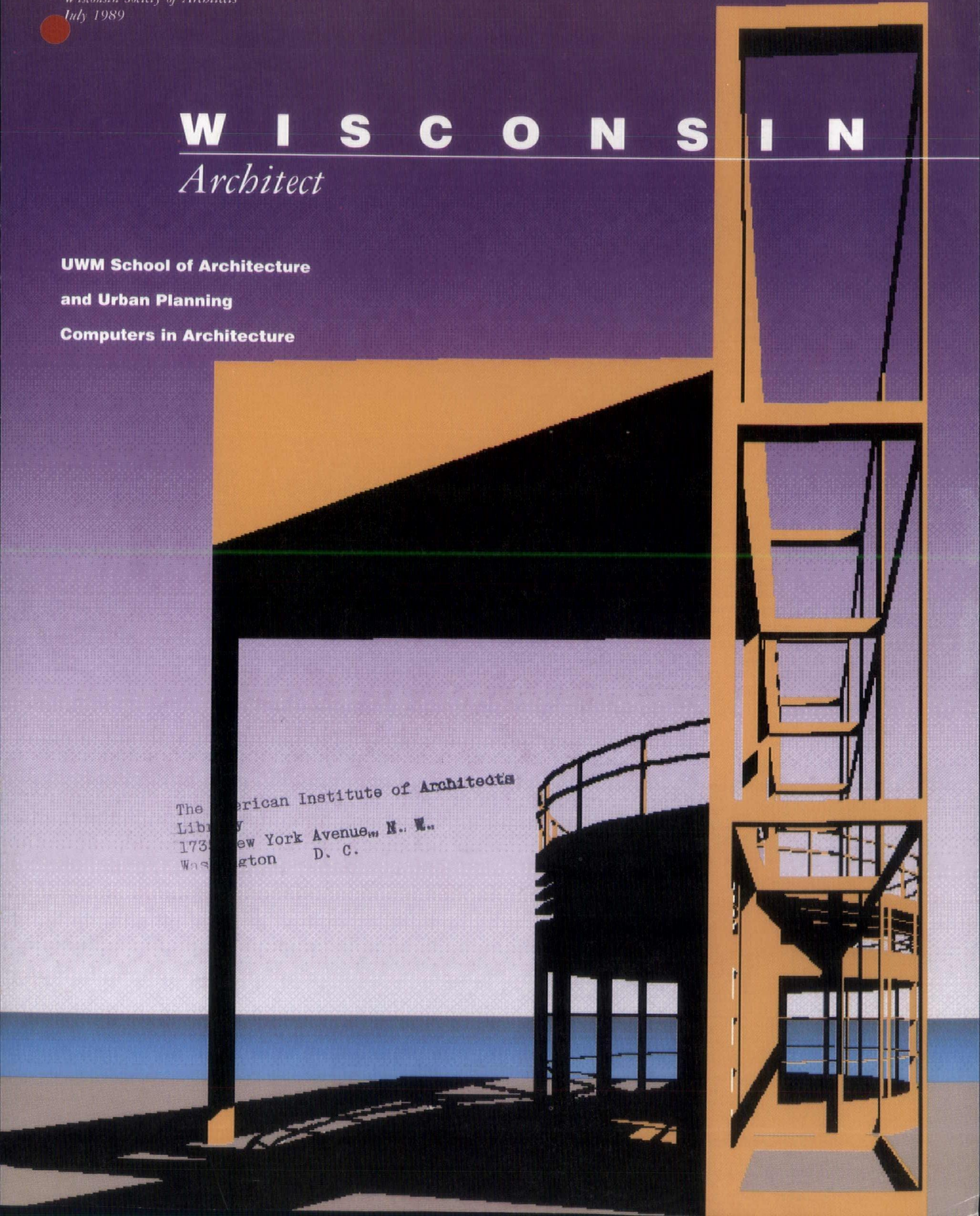
Wisconsin Society of Architects
July 1989

WISCONSIN
Architect

UWM School of Architecture

and Urban Planning

Computers in Architecture



Wisconsin Society of Architects
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July 1989

WISCONSIN

Architect

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The curriculum has changed dramatically . . . most noticeably in the area of computer applications.

This fall, The School of Architecture & Urban Planning at the University of Wisconsin-Milwaukee will be celebrating its twentieth anniversary. Much has happened in the two decades since the program started. It now houses nearly 800 students and over 30 faculty, offering Bachelors, Masters and Ph.D. degrees in architecture, and has been designated a Center of Excellence by the Wisconsin Legislature.

The curriculum has changed dramatically over the years, perhaps most noticeably in the area of computer applications. The School now boasts a state-of-the-art computer laboratory which is used to train students and local professionals. The last two years have seen the development of an innovative computer studio, where students develop designs on a Mackintosh II placed adjacent to their traditional drafting table.

This issue focuses on the use of the computer in the Department of Architecture. It is timely as it focuses on our latest attempts to keep Wisconsin at the forefront of architectural education.

During the 1989-1990 academic year, SARUP will be hosting a number of events to celebrate its anniversary. This summer, we will be sending out the details on these activities. We hope you can join us at Englemann Hall.

Robert Greenstreet & Doug Ryhn
Co-editors

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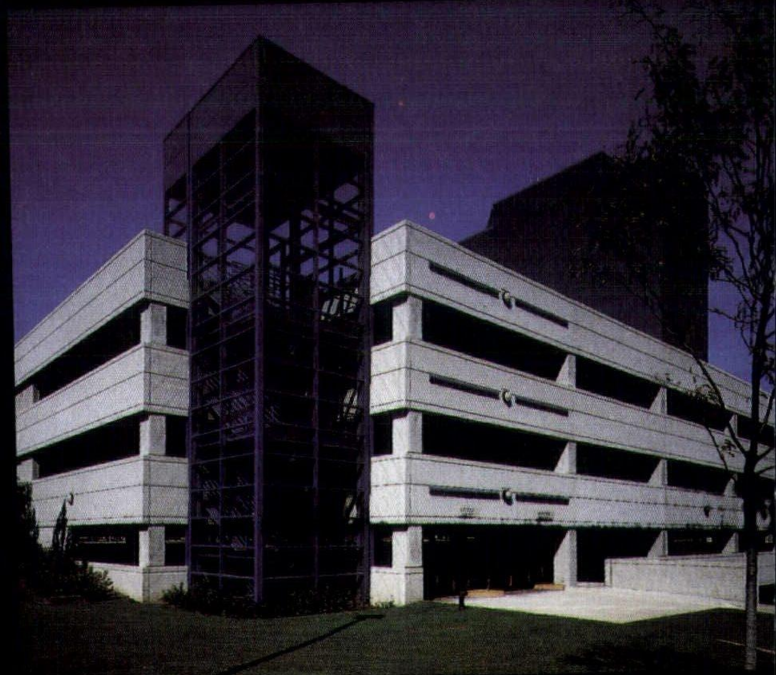

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Computers in the Studio

by Michael Utzinger

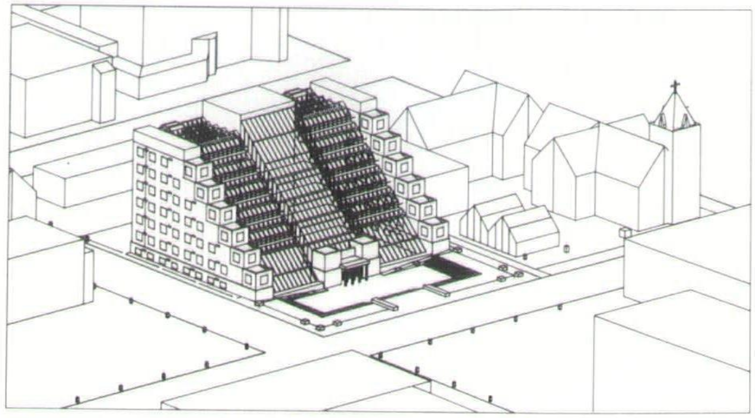
"As a graphics tool, the computer is nothing more than a glorified set of triangles and parallel rule. As a calculator, little more than a slide rule. You may use it exclusively or not at all in your studio projects." Thus I introduced the computer to the energy conscious design studio. Thirteen students registered for the class. We had seven Macintosh II computers and eleven drafting tables. Six of the students had no prior experience with CAD programs. Nine had never used a Macintosh computer. Two had never used any computer. Two had earned a prior degree in Computer Science. With the variety of prior experience, we embarked on an exploration of the uses of the computer in architectural design.

I would not have introduced the computer to the studio if I did not have confidence in the hardware and software. AutoCAD, the "Industry Standard," is an excellent drafting tool, especially for construction documents. It is not a design tool. Ask anyone who has waited literally hours for the generation of a hidden line perspective of moderate complexity. Instead, we used a French program called Architrion. This program includes 3D, 2D and Quantifier modules integrated into a single program. The real advantage of the program is the ability to provide quick axonometric, section and perspective views of the design as the work progresses. Hidden line perspectives of simple models (100 blocks or less) took less than a minute to generate. Complex models (1500 blocks) required thirty to sixty minutes. I believe the speed and simplicity of perspective generation allows the computer to be used as a true design tool.

Perspective drawings have traditionally provided the architect with the means to evaluate the spatial qualities of a design. In the studio design process, perspectives are typically developed for one or two exterior views and one major interior view. The perspectives are typically developed towards the end of the studio project as a part of the presentation. With the computer and appropriate software, we had the ability to develop perspectives from many points of view throughout the design process. Early in the design process students used sunshots to study solar access, massing and fit of the design in context. As the design proceeded, students began to to use the perspective tool to explore their design of spaces within the building. This process was especially useful in the second project, an office building design. Most of the students included an atrium in their design. The computer was used to explore the development of space design throughout perspective study. Students were able to include views from inside out and outside in.

A few of the perspectives from the second project are illustrated here. These illustrations are entirely computer generated. All of the illustrations included in this article were designed by students with no prior experience on either the Macintosh computer or with the Architrion program. Some of the students chose to use the computer to provide rough massing perspectives and then trace final perspectives over the rough models. All of the students have become converts to computer aided design. They view the ability to develop rapid perspective hidden line views as a true advantage in the design process. I plan to continue using the computer as one of the tools in the studio.

EDITOR: Michael Utzinger is an Associate Professor at UWM SARUP.



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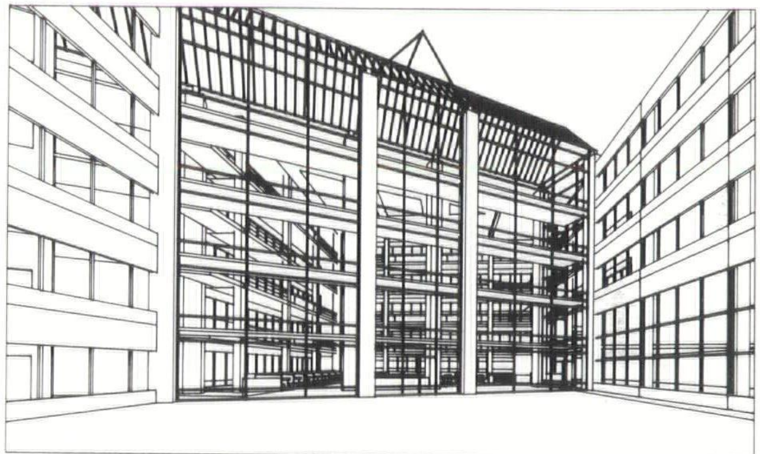

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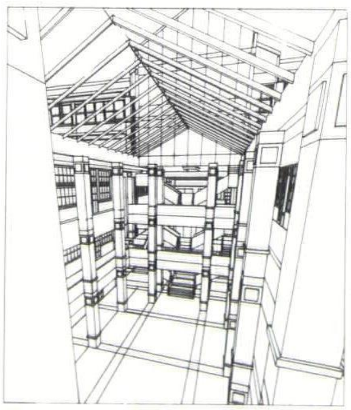

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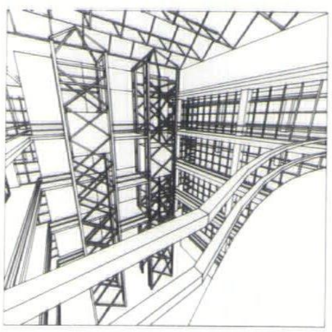

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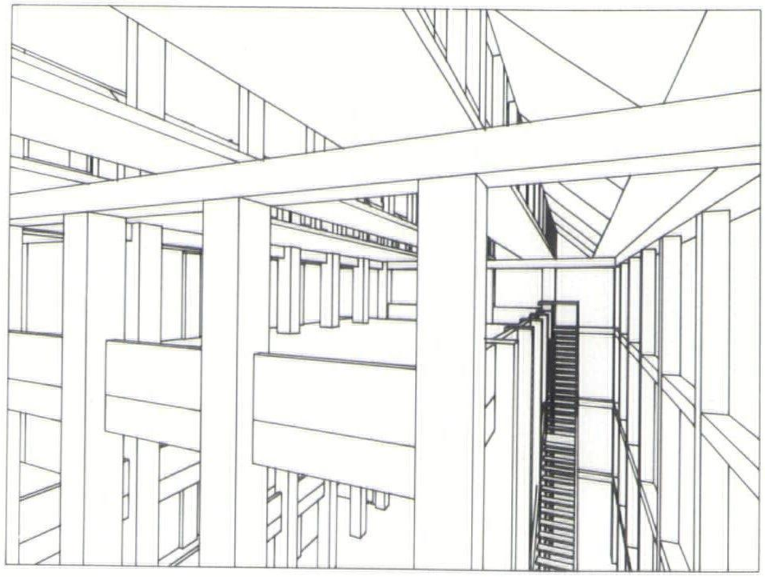


Peter Zirbel

Computer Presentation Graphics for Architects

by Ed Cordes

The traditional role of the personal and micro-based workstation in the architect's office has been as a stand alone or office networked computer drafting station. These stand alone units are wonderful time savers and production tools especially when used in conjunction with side packages such as detail libraries and cost estimating programs. The nature of most 2D and 2½D drafting programs, however, relegates the computer's usefulness to the more mundane office tasks such as contract document development. Through third party programs and project management software, PC level computers have recently begun to be utilized for applications as varied as construction supervision and facility planning/design.

One aspect of the architectural field in which the personal workstation has yet to be effectively integrated is in the production of presentation graphics and promotional material. The advent of faster, more user friendly workstations along with the development of new forms of software promise to bring professional presentation graphic capabilities to the under $10,000 workstation. An examination of the various approaches as well as a brief description of particular products will give a more complete understanding of the direction in which this computer specialty is headed. Three areas of development seem to offer the most excitement for near future applications: video imaging technologies, high definition rendering and animation.

All the programs and technologies discussed in this article are currently available for both IBM® and Apple® based systems. The theory behind the technology presented was originally developed for larger work stations or small mini's such as the Apollo® and Sun® systems. More efficient software design coupled with higher clock speeds and more onboard memory has made it feasible to translate these programs to the PC environment. The cost of these add-on systems and software has also decreased dramatically, with most packages having an average cost of around $1500.

The immediate applications of the technology include high definition interior and exterior renderings, walk-through animations, texture and material mapping, interactive design and in-house presentation / promotional graphics. A workstation dedicated to these types of technologies and including desktop publishing software will allow a small to medium size firm to create all its promotional and presentation material in house.

Video Imaging

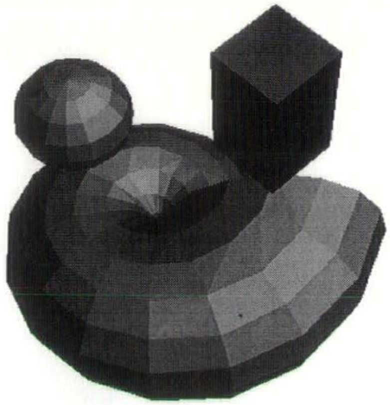
Video imaging technology refers to the input and manipulation of video tape based images in a computer environment. Input usually occurs through a standard ½ inch video cassette recorder or handi-cam. The higher the quality of the original image, the clearer the resulting computer image. High-end systems often utilize expensive still picture or high definition (HDTV) video cameras for superior input quality. Acceptable results can be achieved, however, using only an inexpensive home VCR system. The input images are converted by the computer into pixel based screen graphics. The quality of the hardware involved, determines the clarity, definition and color variance of the image.

Video imaging systems involve both hardware and software components. The image interpretation, input and signal output are all controlled by the hardware portion of the system which is packaged as an expansion board, filling one of the expansion slots inside your PC. The actual image manipulation occurs using one of a number of different software packages. AT&T's TARGA 16 board and Truevision's Image Processing software (TIPS) is the IBM based system in use at the School of Architecture and Urban Planning. There are plans to purchase a similar Macintosh based system in the near future.

The environment in which the images are manipulated is very similar to low priced computer paint programs. The systems are therefore consistently easy to use. Tools appear on the desktop in icon form and the programs have an overall intuitive feeling to them. Imaging software does not have the rigid and exacting nature that a CAD program does and should be used more for finish rendering than hard line image creation. Tools common to most programs include blends, cuts, copies and various paint brushes. Imaging software usually makes use of the full palette of colors available to it, which is often greater than a million. Color selection is determined by the amount of video display memory. Copy tools allow a forest to be created from a single tree and a city from a single building. Tinting controls allow an early afternoon scene to be instantly converted to a twilight landscape. Fill and paint commands allow endless variation in color schemes without endless hours of rendering.

A useful feature found in most higher end systems is genlock and chroma key capabilities. The full line of TARGA systems comes equipped with genlock devices. A genlock board adjusts the multiple scan rates to a uniform band length permitting smooth output. Chroma key is another important advantage, allowing certain colors on the screen to be interpreted as transparent. Live video images, line drawings or CAD rendered perspectives can then be incorporated into a video painted shot. With this capability, CAD drawings of proposed projects can be inserted into an image of the actual site with photo-realistic results.

Design rendering is the primary use of the system at the School, and a large library of entourage elements has been created and stored on disk for insertion into the drawings. It is possible to generate stunning lighting shots of a proposed project with a minimal amount of time invested. The same template and background is used multiple times. The TARGA system is also used for quick site analysis sketches and color scheme determinations.



Ed Cordes, Adobe '88®

Output is achieved through a number of pathways. A dot matrix printer serves as a preliminary output path. High resolution output through a 4000 lines per inch film recorder produces either slides or prints with vibrant color saturation.

High Definition Rendering

High definition rendering refers to a number of products and processes which enhance a computer generated three dimensional model. Some of the lower end products such as Auto-Cad's® AutoShade simply apply gradations of a limited color palette to a wire frame surface. While this level of image creation is acceptable for preliminary massing studies and perspective generation, it is difficult to achieve a final rendered image using these products. A number of products such as Arris by Sigma Design® and the soon to be released version of MacArchitrion® by Gimeor of France offer the next step in realistic rendering, shadow casting and surface reflectivity. In these programs, the user sets the incidence angle of the sun or interior directed light sources, and the program calculates the resulting shadow patterns. Varying surface reflectivity levels allow the user to identify materials by their spectral qualities.

The next level of realism in computer rendering is achieved using processes such as ray tracing and texture mapping. Both processes are memory intensive and the resulting image may require many hours of computer time to complete. Ray tracing refers to a process by which theoretical rays of light are cast from the viewers eye to the rendered object. An extremely high degree of accuracy in reflective surfaces can be achieved using this method. AT&T's TOPAS® software is an example of a ray tracing product developed for PC systems.

Texture and surface mapping is a process by which a library of scanned patterns and textures are applied to the surfaces of a three dimensional computer object. Many of these programs also incorporate shadow casting and ray tracing. Common textures include water, stone, brick, wood, marble, glass and steel. Macintosh based programs such as Byte by Byte's Sculpt-Animate 4D® and Visual Information's Dimensions® also produce stunningly realistic output from three dimensional models. A number of highbred systems such as Pixtar's RenderMan®, which will soon be integrated with AutoCad®, allow the user to combine photorealism with life-like animation sequences. As a witness to the realistic effects of such programs, Pixar was presented an Academy Award for its animated short using RenderMan. It was the first time a computer generated movie had received the award.

It should be noted again that all the above mentioned programs are designed for PC systems, and although somewhat slow, create amazingly realistic output. The speed of the rendering process and animation sequences will continue to increase as the clock speed of personal computers also increases. The various products will also continue to evolve towards a more uniform file structure as standards are developed for this relatively new subspecialty.

Another method used to create high definition computer renderings involves the importation of 3D graphics into the 2D world. A number of very powerful design tools have been developed specifically with the graphic artist in mind. These tools have only recently been embraced by architects and related design professionals. Programs such as Adobe Systems Adobe '88® and Aldus Freehand® for the Macintosh were designed to manipulate vector based images and create output using Postscript® or printer based language. Postscript allows the image to adjust to the resolution factor of the output device rather than the screen. Gray scales and custom mixed colors can also be used. By importing a 2D image of your 3D object, these programs can be used for extremely accurate finish rendering. A less sophisticated yet similar process involves the importation of vector images into pixel based rendering software such as PixelPaint® for the Mac. All these products produce high quality results when output to a film printer or rendering service bureau.

Animation

One of the newest and possibly most powerful tools and techniques available for use on personal computers is real-time interactive video software systems. Computer generated graphics have for many years been incorporated into animation sequences, but it has always been through the time consuming and tedious process of single frame photography. The relative increase in computer speeds coupled with more efficient video display systems has finally allowed the micro computer to project a series of images at speeds approaching real-time animation. There are a number of outstanding products for both the IBM and Mac environment

Robert A. Vajgrt, AT&T's TARGA16®

which allow user created animation sequences. Some of these programs also allow the user to interact with the sequences, making them excellent tools for developing promotional and educational displays.

AutoCad supplies a well written shareware program with its AutoShade package called AutoFlix®. A demonstration film roll included in the documentation takes the user on a guided tour of a proposed design for a summer house. The user can choose, with their mouse, which portions of the design they wish to review. The AutoShade images are presented at speeds up to 6 frames per second (depending on the speed of your computer). Automated routines create multiple images along a pathway eliminating the time consuming task of preparing each slot.

VideoWorks II® from MacroMind is an intuitive Mac based product which serves as a organizing tool and tour engine for displaying simple animation sequences. While most artwork is created using a variety of other packages, VideoWorks animates the cast members and mixes the action with a sound track. The program's open-ended design and its ability to integrate with HyperCard stacks make it an extremely attractive product for promotional and presentation situations. With an output path to video, a PC workstation becomes a virtual animation studio combining image creation, editing, cutting and mixing.

Hardware Considerations

If your practice currently is using a personal computer graphics workstation, it is more than likely that you have most of the hardware required to operate these high end rendering and presentation packages. Basic necessities include a color display monitor, a hard drive with ample free disk space and at least one megabite of extended random access memory (RAM). The complexity of current CAD and rendering packages necessitates at the minimum, a fast 286 or AT level machine. A Macintosh SE or II will provide enough power for Apple based programs. Many of the systems including the video imaging packages also require the purchase and installation of an additional memory and processing board dedicated to this task.

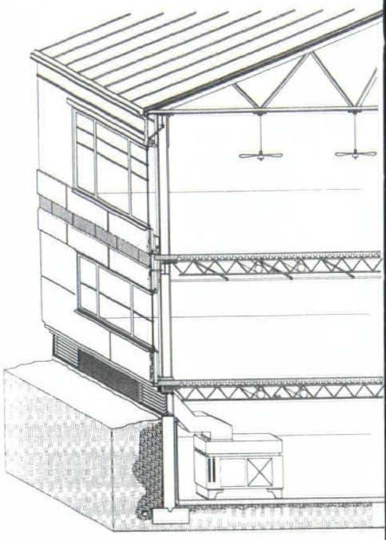
Output devices are a second area of concern and can become quite costly. Making the choice between the variety of options depends on the type of rendering program used as well as the quality of the output desired. Image quality can range from draft finish dot matrix printer copies all the way up to high end color printers and slide makers. Another pathway is a direct route from the computer to a video recorder. This form of output is especially desirable for animated sequences and material being assembled for a video presentation. Some video boards such as the TARGA series automatically convert the computer based Red Green Blue signal into one that can be interpreted by the VCR (the signal must conform to the National Television System Committee's standards). If the board you are using does not perform this conversion, an additional adaptor device will be needed.

Scenarios

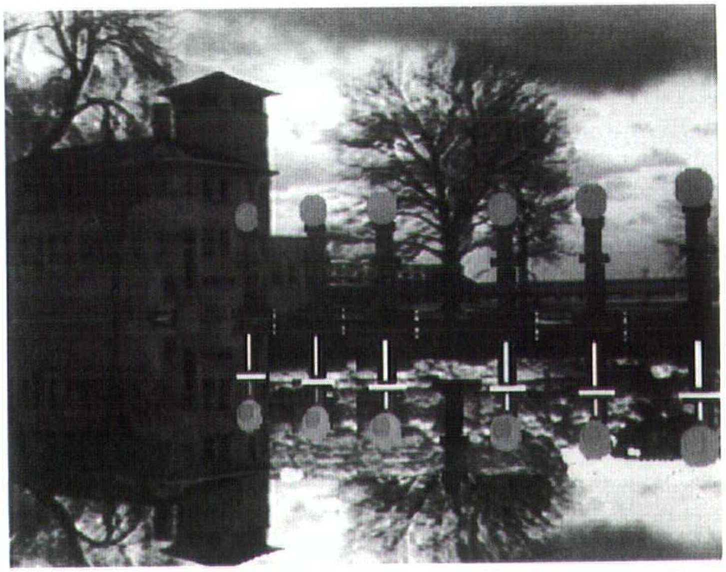
The potential applications of high end rendering techniques to the architectural field are only beginning to be realized. As the quality of computer rendered images continues to approach that of manually produced drawings, the technology's acceptance into mainstream architectural practice will continue to grow. If managed effectively, these systems have the potential to allow the client to preview many more possible solutions before a direction is taken. The term presentation graphics will take on a whole new meaning as the images incorporate actual site elements and blend undetectably the proposed with the existing. The marketing and design implications of animated walk-through presentations threaten to further transform the client-architect relationship.

All three areas of computer based presentation graphics are rapidly evolving. The improving technology often outstrips the available hardware, and as faster more user friendly computer systems are developed software technology branches off into new areas. In the next few years it is likely that more universal standards will be developed allowing true mobility of files between different machines and software packages. It is also possible that all three rendering techniques will be contained in a single program or on a single system. The continued refinement, standardization, price reduction and integration of these various programs will allow a rendering station to become a common component to a computer integrated architectural office.

EDITOR: Ed Cordes is a recent graduate and an Instructor at UWM SARUP.



Ed Cordes, Super3D



Anthony J. Schnarsky, TARGA16

WSA

Fall Workshop

October 13, 1989

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Call For Contract Documents

By Tony Schnarsky, AIA

This article is a request for cooperation between practicing architects and educators to help improve contract document development knowledge. On one side of the equation, practitioners complain that formal education lacks sufficient skill building on what easily takes 75% of their office time, contract documents. Admittedly, most of this knowledge transfer is assumed to take place in internship, apprenticeship and in-office training. I believe that the basic assumptions in obtaining a license require practical training under the observation of registered architects.

The second half of the equation is that educators have barely a few more minutes than practitioners, but that time gives them the opportunity to explore new information technology and to establish frameworks for knowledge building. So please realize that this request for your best secrets for preparing contract documents is sorely needed and valued. My contribution will be to help students understand the structure of contract documents and to apply the most appropriate computer technology to make this aspect of our profession easier to achieve. You will have to risk sharing your methods to help benefit our entire profession.

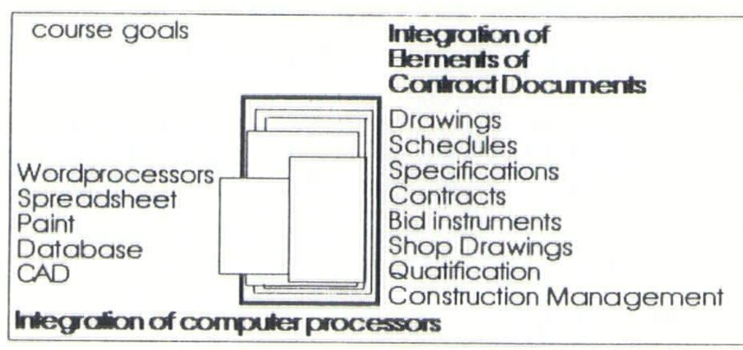
Professional-Technical: Architectural draftsperson needed. Entry level salary offered. Person with less than five years supervised experience need not apply. CAD skill preferred.

Those firms that have acquired CAD know that it takes a very long time to integrate this technology into practice. The national enthusiasm for the computer in architectural practice often neglects the realities of distributing the power of the tool to most individuals in the firm. If you are typical, you will have recently purchased a personal computer with a CAD capability. More advanced, you have acquired a networked CAD system or a mini-computer based system. Meanwhile, you have discovered the tremendous hidden cost and loss of productivity while your staff gained skill and control using CAD. Again, if you are typical, you seek already trained technicians or entry level personnel. After training, you want them to stay with the machine in order to avoid further training costs. Meanwhile, in the front office your secretarial staff remains assigned to the word-processor eight hours per day doing an incredible job generating information.

So what is the problem now Schnarsky? Fifteen years ago you did tell us to jump into the use of computers didn't you?

Today's message is to continue leaping, but let's examine the next cliff. Ironically, today's architectural office has adopted the most complex and demanding type of computer information processing that exists—computer graphics. There is no other branch of information processing that demands so much expensive hardware and software and such intensive training than CAD. Offices are adopting and adapting to this with great enthusiasm as well as cost, but has CAD really delivered its implied power and productivity? My impression from visiting offices and former students is not yet. The main reason for the weak success is that by far most first applications of CAD by new users has been to mimic their old methodology on a completely new tool. I cannot tell you how many times that I have conferred with practitioners and heard them say they are looking for "appropriate projects" that have great repetition before they use CAD. How sad. They have completely missed about seventeen other virtues of CAD because they do not understand the tool's fundamental nature.

Why has our practice embraced CAD first? Mainly because we identify the tool as graphic. We are, after all, graphic creatures by training. Add that our practice is labor intensive, demanding high performance in technology integration on constantly changing projects. There must be a hope that CAD will aid us in this process. I believe the failure to integrate CAD with greater positive impact on architectural practice is caused by a serious educational deficit. The deficiencies, including fundamental computer literacy, have caused our profession to miss the major reasons why the computer can have positive impact on our creative workplace. To name a few blindspots: many of us cannot type; we would rather draw than write; although structures was required, we loathe mathematics; strange new concepts like the "new math" elude us. More pointed is the activity that takes most of our time in practice, contract documents, is learned the hard way—informally under supervision by an already over-burdened project architect. Disagree?



To summarize, the position taken in this article regarding the following concerns include: One, CAD is the most exotic form of information processing that requires great investment and training. Two, other powerful information processing such as the electronic spreadsheet, paint programs and database have been skipped while the architect reached for CAD. These neglected processors return productivity ratios of 3 to 1 for costs and training time, less than one quarter that of CAD. Three, there is harm for organizations and individuals that require departments because of specialized skills. The integration of computers into practice is best started from the principals on down. Last, the source of the viewed failures to better implement computers in practice stem from educational deficiencies.

It is the last view that caused me to write this critique. This year will be the twenty-second year that I have taught a "computers in architecture" course. Since 1984, the demand for the gateway course has exceeded the capacity of the School of Architecture and Urban Planning's computer lab at UWM. The main purpose of the gateway is to give a positive introduction about the computer to young practitioners-in-training. For all those years, CAD has been the starring processor because of its graphic identity. Educational innovation recently has included computers in advanced courses using color perspectives modeling and video imaging. Personal computers are being used in structures and energy design courses. "Computer based studios" have been run for three years now at UWM. The Facility Design Studio features a wide range of computer processors integrated with programming and interior space planning. But in truth, most of the computer work has been CAD based.

The "Call for Contract Documents" is a request for architectural practice groups to contribute model examples of real documents to the educational program in architecture. The new course, recently approved for trial offering by the graduate program committee, is titled:

Construction Documents and Database

The course goals include:

- Generating specifications, schedules and drawings using word-processors, electronic spreadsheets and CAD.
- Examining the inter-relationships of specifications, schedules and drawings from a theoretical and practice standpoint including technical integration, descriptive systems, readability and liability.
- Introduction of traditional and recent formats for contract documents including schedules, model specifications, model building codes, modular coordination and the highly praised AIA ConDocs format.
- An examination of the computer concept called database as it impacts on all of the parts of the contract documents.

The ambitious set of course goals give you an idea of how many missed opportunities there might be for architects if they are to better understand their most important instrument of service, the contract document, in light of recent evolution of computer technology. Practitioners, you are not reaching the promise of computers if you are just mimicking older formats.

The crucial part of the call is that I need complete sets of your real documents in order to teach this course. There is no question that these represent considerable divulgence of proprietary methods regardless of the involvement of computers. The University classroom will be an open place for the sharing of many principles embodied in a model set of documents. In appreciation for this loss, there is no way to close the educational gap without real data.

The goals of the course are to add value to the way the information is described, inter-related, integrated and derived. Every component of the building will be scrutinized and cross checked in a systematic way as we search for better ways to manage concise comprehensive description. We are not going to just copy the information. We are going to study ways to transform the same kind of information using computer database concepts.

If many firms participate in sharing documents, a method involving their judgement by an impartial AIA member and general contractor will be used to select the most informative set. The course needs only one sufficient model for a semester's study.

What can the selected firm expect to get from the investment? There will be several dramatic new computer based formats to consider. And the computers assumed will not just be expensive CAD workstations. An electronic copy of all computer generated files will be provided. Any publication of the results will include attribution to the source firm. Methods of systematically organizing the information for future retrieval and use such as generic details, library elements and schedule formats will be made available. Most important, firms might wish to hire a professional trained in this topic because it links present model practice with established computer techniques.

Call for Contract Documents

Notice of your willingness to submit a complete set of contract documents is required on or before September 15, 1989. You will be contacted within two weeks in order to schedule a visit by a student to accept the set of documents. From these sets, the semester's case study will be selected. In all cases all sets of documents will be returned.

- write to: Anthony Schnarsky, Associate Professor
Department of Architecture
Engelmann Hall
School of Architecture and Urban Planning
P.O. Box 413
Milwaukee, Wisconsin 53201
- call: (414) 229-4014
- Information required:
Office Name
Project Architect
Architect's address
Phone number
Project name
Project completion date (projected)
Project description
Contract document's size & number
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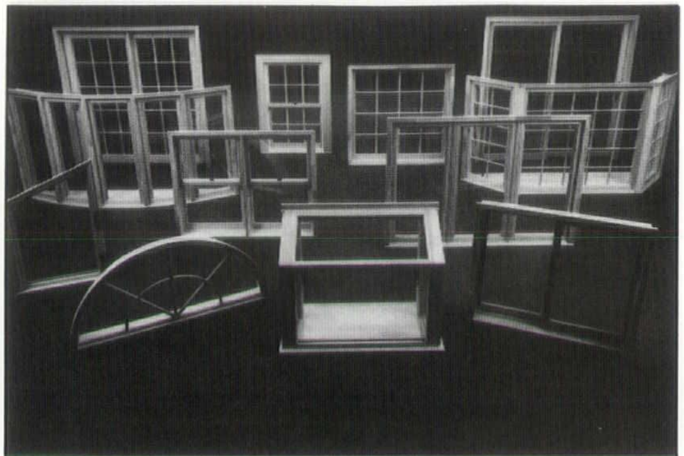
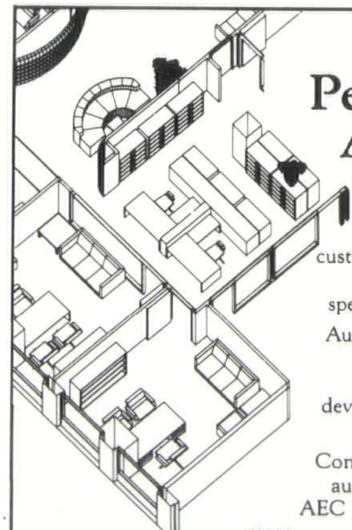
Owner of contract documents





More Than a CAD Lab

A Look at UWM SARUP's Information Center

by Mark Roth

In the past five years the School of Architecture & Urban Planning (SARUP) at the University of Wisconsin – Milwaukee has expended considerable time, effort and funding in the development of a comprehensive computing facility for its staff, students and faculty. The Information Center, as it has come to be known, strives to meet the academic computing needs of over 750 graduate and undergraduate students, 60 full- and part-time faculty, and 15 staff members and administrators. This article will offer a brief look at the Center and will discuss current trends in computer-aided architectural and planning education within the school.

Current Offerings

The Information Center occupies about 2500 square feet in UWM's Engelmann Hall. Three specific areas comprise the center: CAD Lab, Instruction Lab, and Resource/Browsing Room. At present, the CAD Lab houses twelve IBM AT graphics workstations, three IBM PC clones, twelve Apple Macintosh Plus microcomputers, and a host of printers, plotters and other peripheral devices. This area is known as an "open lab" where students have 7-day per week access to general-purpose computing machines and miscellaneous off-the-shelf software packages. A "dual-platform" strategy of offering a mixture of Macs and IBMs has been quite successful, allowing us to restrict use of the more expensive IBM AT's to computer-aided design (CAD) applications and thereby alleviate overcrowding.

Primary users of the IBM graphics workstations are upper-level undergraduate and graduate students enrolled in one of two School of Architecture course offerings – Computers in Architecture or Advanced Topics in Architectural Computing. These students, usually numbering 60-70 per semester, most often have had some computer experience in high school, at a technical school, or in another college course. The CAD software employed on these units is AutoCAD by Autodesk, Inc., the most popular microcomputer-based CAD package on the market. Several third-party packages that run in conjunction with AutoCAD are also available. No other software packages reside on these machines on a permanent basis, as students are encouraged to use the stand-alone Mac Plus units for word processing, spreadsheet, statistics and database applications. From time to time, other software packages are installed on the IBM workstations, usually in response to specific curricular offerings and/or research projects. In the past, these have included communications, networking, data analysis, video imaging, desktop publishing project management, mapping, and others.

The other computing area in the Information Center is the Instructional Lab, which houses various pieces of high-end computing equipment including two 80386-based IBM clones, two powerful Macintosh color workstations, one laser printer, one color slide-making unit, two flatbed scanning devices, modems, a fiber-optics link, and miscellaneous output devices. There is also a unit which enables the projection of computer displays and video images onto large screens, a remarkable tool for demonstrations and small group presentations. The function of this smaller lab is to provide faculty, staff and research assistants (typically grad students) the use of assorted software packages and hardware systems with which to assist in research, writing, curriculum development, and computer integration. This area is also designated as the school's primary training facility and software "clearinghouse". It is here that faculty and staff are able to investigate and learn to use both off-the-shelf and proprietary software packages and to familiarize themselves with various computer operating systems. In this single area they have access to six specific systems: MS-DOS, OS/2, Unix, Xenix, Macintosh OS and Apple ProDOS, as well as direct links to campus mainframe systems and a Cray supercomputer system at the University of Illinois Champaign-Urbana. Software installed on the Instructional Lab machines includes many of the most popular and powerful on the market: Aldus PageMaker, Adobe Illustrator '88,Microsoft Excel and Word, Ventura Publisher, Wordperfect, AutoCAD, AutoFlix, AutoShade, MacDraw II, FrameMac, and others.

The third and final area within the Information Center is the Resourse/Browsing Room where one can find the school's collection of over 800 books, journals and current periodicals relating to architecture and planning professions. Audio-visual, media and photocopying services are also provided here.

The tree divisions of the Information Center discussed above by no means comprise all of SARUP's computing horsepower. The technologies found here are directily related to those found in faculty offices, administrative areas, the graphic center, and in the new computer studios. It is an on-going process to get each of these components to interact to provide and accessible, comprehensive, and cohesive computing environment within the school.

Trends

We're in a time of exciting changes in the field of computer-aided architectural and planning education. Significant advances in hardware and software, making the technology faster, cheaper and more powerful, have played an important role. These advances have made quality tools more and more accessible to a growing number of students, instructors and professionals in the field. Since it first opened in February of 1986, the SARUP Information Center has tried to keep up with these advances by offering flexible, interactive software and an assortment of local processors with differing capabilities for graphics, color, local storage and computational power. During this time many trends have begun to emerge:

- Students and faculty continue to favor IBM and IBM-clone machines for CAD applications. Quality software, superb color graphics (1024 X 768 resolution as currently configured), a greater choice of output devices, and a continued large install base in the professions are contributing factors.
- The Macintosh computer is the machine-of-choice for most other applications. This is even more true in light of the recent influx of superior software products being developed for these units. Users are more comfortable with the Mac's graphics-oriented interface, consistent look and feel, and simple file-handling techniques. This bias is evident even when the IBM unit is comparably equipped with a flashy DOS shell or windowing program. Additionally, students and staff report that the time needed to get "up and running" on a Mac and to master most basic operations (Save, Delete, Print, etc.) is minimal in comparison to the cumbersome DOS-based machines. The introduction of OS/2 and Presentation Manager may in time, however, tip the scales in IBM's favor.
- Students and staff prefer to utilize "open-ended," off-the-shelf, flexible software packages that can be used for any number of applications. Typically these packages are used to provide an environment in which to explore, test, and convey ideas. Many students continue to use them beyond their classwork for projects, studios and professional efficiency.
- Stand-alone units are the norm. Users wish to concentrate on their particular applications and not have to interact with any type of networking software, no matter how friendly or unobtrusive. There is little desire to learn a new set of commands in order to simply "share" a file or direct output to a printer. The vast majority of users will continue to invest in SARUP's "sneakernet" system.
- Speed is an increasingly significant factor in the everyday use of microcomputers. Machines running at the standard 4.77 to 8 megahertz are extremely inefficient for most applications other than word processing or simple graphics design. "Bottlenecks" result almost everytime that output is generated, a screen in regenerated/refreshed, a CAD drawing's lines are hidden, etc.
- Memory requirements (RAM) have taken a quantum leap from the bygone days of 64K to a present day 2-4 megabytes! Increasingly complex software, memory-swelling document description languages, advanced operating systems, attempts at multiasking, and the user's avaricious appetite for large and fast screen redraws are the culprits here.

- Direct on-line access to remote mass storage and output devices is not a priority at this time. Most micros are being delivered with fast, efficient, and reasonably-priced 40-150 megabyte hard disk drives, giving users more than adequate room in which to store and retrieve their work. Affordable, high quality output devices, especially laser printers, are becoming more prevalent throughout the campus, with local photocopying/duplicating outlets also beginning to offer this service.

- Access to remote databases, file-servers, electronic mail services, bulletin boards, mainframe and minicomputers will be a factor as long as these services are cost-efficient, fast and reliable.

The Immediate Future

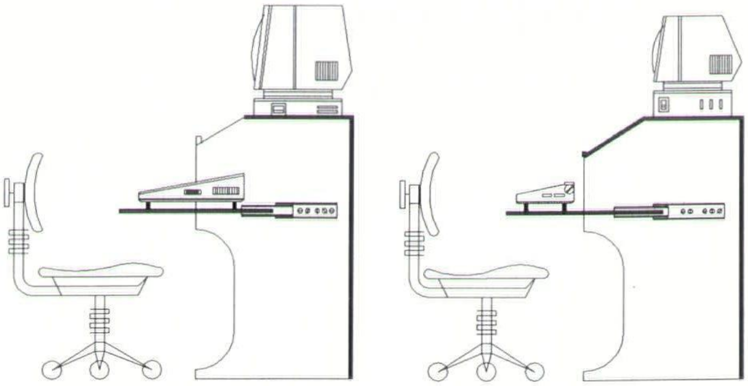
The SARUP Information Center will undergo a restructuring in the summer of 1989. Plans call for relocating the Browsing/Resource Room and expanding the computing environment to create separate spaces for CAD and general-purpose applications. The Instructional Lab will remain intact, but will be upgraded to serve as the site of SARUP's AutoCAD Training Center, an enterprise which offers CAD training to area professionals through the University of Wisconsin – Extension.

A key stategy is to adopt Apple's Appleshare file serving system for use with the Macintosh Plus units. These machines will be wired to a dedicated Mac II with a large disk drive compatible with the Apple Hierarchical Filing System (HFS). Appleshare will provide the foundation for multi-launch programs, which can be used by several people simultaneously, or multi-user applications, which allow several people to work with the same information at the same time. User operation and access control (privacy) are simple; no different than using a local disk drive.

Another modification is to employ 386-based IBM clones as the primary CAD processors. The increased speed and performance of these machines should have a dramatic effect on production within the CAD lab and will allow us to continue the relationship with Autodesk, Inc. and other software vendors. Within the next few months decisions will be made concerning the installation of a new operating system (OS/2? Xenix?) and adopting a new user interface (Windows? Presentation Manager?) for these units.

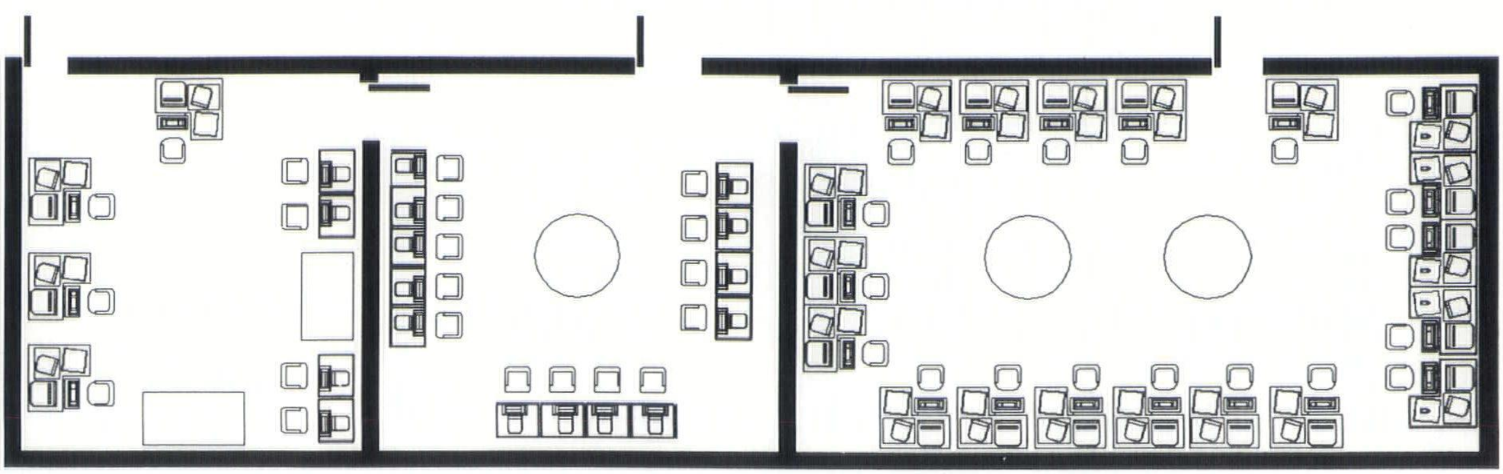
For the next few years the Information Center will continue to serve as the nucleus of SARUP's computing environment. The pieces are in place for the effective use of computers in educating architects, planners, designers and developers.

EDITOR: Mark Roth is the Manager of the Information Center at UWM SARUP



James Robbins, AutoCAD

Ann Forerst, AutoCAD

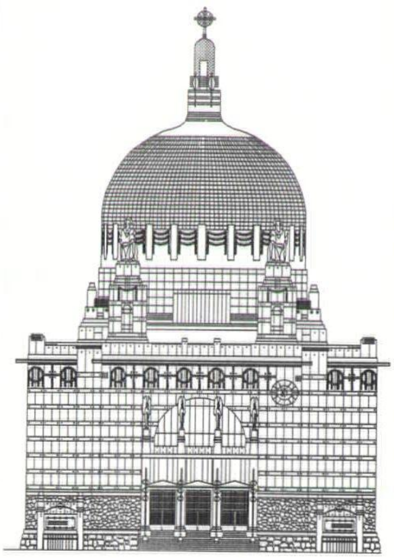


Mark Roth, AutoCAD

Computers in Architecture at UWM

A Retrospective

By Tony Schnarsky, AIA



Brian Wittleman, AutoCAD (1985)

Today, the School of Architecture & Urban Planning offers two introductory CAD sections every semester. These sections are usually full, with waiting lists. In the early years, computers were considered a risk or a tangent to architecture. There was always a great deal of curiosity about the tool, but only a small percentge of your professionals withstood the rigors of computer technology. Looking back, you will be surprised at how early some of the significant computer applications occurred right here on UWM campus.

New classes in "Computers in Architecture" are told that before 1984 there were the "dark ages" in computing usefulness. Then came the affordable micro computer. The May 1984 issue of *Progressive Architecture* was the signal for architects to accept computers with open arms. In my new class, I provide a slide show of 3D computer graphics from before 1984. Some of these drawings have over 1,000,000 edges projected in what used to be called 3-point perspective. These computer models were built with keyed-in coordinates for every vector using keypunch machines and remote terminals. In the real "dark ages" (e.g. before *Geometry of Environment* was included in the course), students had to wait one day before the plotted results were returned from the plotter in Madison. That poor interaction steadily improved as interactive timesharing became possible (no more key punching and card decks) until, in 1984 just before the advent of microcomputers, it was possible to burst layers of data at the mainframe computer to induce complex models with laser printouts in less than an hour.

It is in fond remembrance to the first decade and a half that I attempt to chronicle the evolution of computers in architecture in Wisconsin. To my many teaching assistants (Michael Kennedy, Wendel Chamberlain, David Plumb, Vehbi Tosun and Mark Klancic), I can say it was worth the struggle.

Before 1985, all our computer applications were written on campus or were donated from other universities. The UWM campus was sorely underfunded in terms of computing resources and computer graphics. Occasionally, the Department of Architecture received new program or "Center of Excellence" funding for the purchase of computer graphic hardware. These bright moments were followed by the realization that the equipment was so unstable that it required an investment equal to its initial cost every four years to maintain.

Because of our persistence and the strain our students put on UWM's computing resources, our School was designated as having a "significant need for" and "an ability to implement CAD" as an instructional unit. In 1985, $5,000,000 came to UWM of which $250,000 went to SARUP for CAD and $750,000 went to the College of Engineering.

Since 1985, because of our growing implementation success more than $200,000 has been added for maintenance and upgrading. Today, we have over 50 microcomputers, and most of them are capable of color CAD. The School has made a commitment to Autocad both on the IBM, COMPAC and HP side as well as the Apple Mackintosh. Operating systems include DOS, HFS and Unix.

For the past twenty years, the evolution of computer graphics leading to Computer-aided-design has involved the major application area. A rough chronology of when important events took place indicated that there were four phases: Batch Run Graphics, Hidden Surfacer 3D, Energy & CAD and Acceptance of CAD. There was not a coherent plan for this evolution. Rather, we simply struggled to make the tool work at improving the practice of architecture.

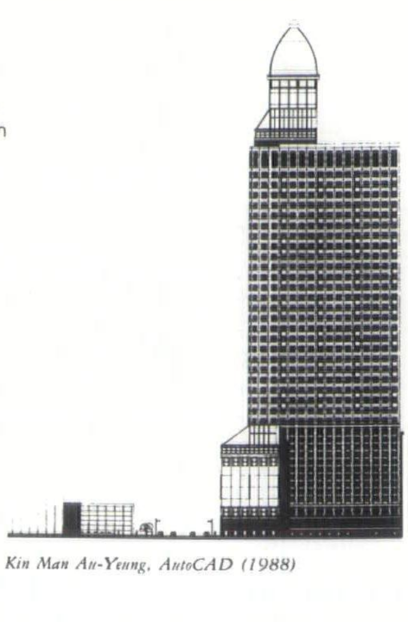
Looking back, the real demarcation between the "dark ages" and the present "golden ages" occurred with the acceptance of the affordable microcomputer CAD workstation. Students today are not taking computer courses for idealistic reasons. They look at the want-ads and see the entry level requirements: "CAD experience preferred." In fact, it is an educational challenge to get students to critically question the computers' impact on the architecture profession.

What does the future promise? For the most part, the computer will continue to take a quiet supportive role in helping the architect think more clearly and systematically. There is a healthy battle among the faculty about the impact of the computer. We are attempting to clarify where it contributes and where it does not. More faculty are using the computer for their scholarship, research and teaching. Many courses and studios are using desk-top publication software to disseminate their instructional successes. Some faculty, on the other hand, have a clear distain about the computer and will not allow students to use it in their courses or studies.

Our computer intergration plan is to continue encouraging faculty to adopt the computer in the privacy of their offices. More powerful office computers are given to faculty that venture into instructional usage. The significant trend is that computers are appearing in the studio, dedicated for a part of the room only. In these cases, the students are finding one microcomputer gives them a many folded set of processes to help question and evolve a design. Generally, faculty that advocate computers are the same that object to labor intensive practices of staying up all night inking. They believe a tool that can transform design decisions is better than methods that take too many hours to delineate and then defy change.

However, the key to our educational effort is to introduce productive and critical thinking about the ways that architects conceive and communicate their design services. In this regard, we have as much of a struggle as we always have had. The computer is no panacea, and it can be a great distraction. The themes for the years ahead will see greater integration of database, technology and construction as well as the traditional training of good visual composers.

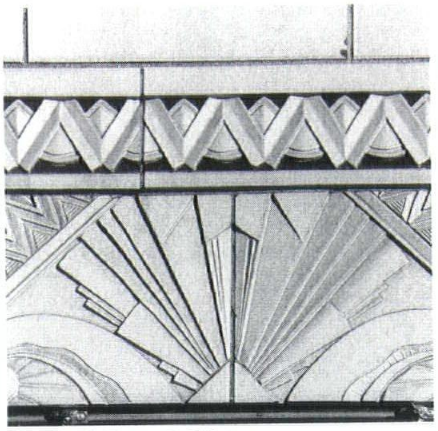
EDITOR: Tony Schnarsky is an Associate Professor at UWM SARUP.



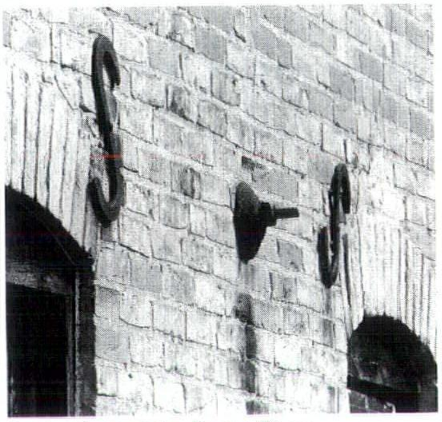
Kin Man Au-Yeung, AutoCAD (1988)

by Grace B. Stith

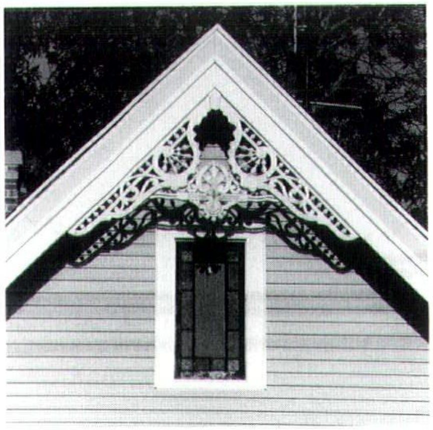
Architectural Adventure In Dane County



Facade, McGovern Building
121 West Main Street, Madison, 1871
Art Moderne decoration, 1936



Iron reenforcement pin, Parman Wagon & Blacksmith Shop
Crescent and State streets, Mazomanie, 1865



Gable, Private Residence
158 West Lincoln Street, Oregon
Gothic Revival, 1894

Dozens of fourth graders in Dane County are finding the appreciation of architectural design as simple as A B C.

"Our house has an A on it," a fourth grader from Stoughton announced at school recently, referring to the roof gable. Kids are looking at buildings and having fun doing it.

This project called "CAPITAL LETTERS in Dane County Architecture" was developed by Dane County Cultural Affairs Director Lynne Eich, with help from Katherine Rankin, Preservation Planner for the City of Madison. Twenty-six images have been photographed by State Historic Preservation Officer Jeff Dean. Each is an architectural element showing a capital letter of the alphabet.

Horizontal posters, four photo units per section, are available to all fourth grade classrooms in the county. They are printed in eight sections and folded accordian style. They can be mounted on walls as a continuing photo-frieze, stacked in a single group or used on a table with each section held by hand for closer study.

"CAPITAL LETTERS" has been distributed to 70 elementary schools, (public and private) as well as to 24 libraries and a few other interested educators.

Exuberance seems the best word to describe the reaction of teachers, students, and parents to this imaginative project. At St. James School in Madison there was excitement on recognizing some of the poster photographs as being from their neighborhood. All children love comparing their own homes with details on the posters.

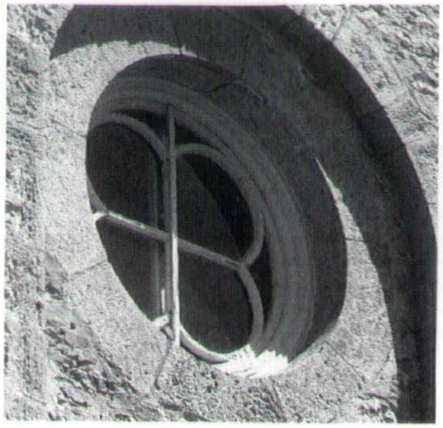
Pam Riepe, art teacher at Black Earth Elementary School, found "CAPITAL LETTERS" a perfect follow-up to her architectural project last fall. She took fourth and fifth graders to the Frank Lloyd Wright exhibit at the Elvehjem Museum in Madison and later, via photographs and sketches, the children remodeled their own school building. Now they are studying historic photographs of the Black Earth area using the alphabet posters as a guide.

The Madison Childrens Museum is incorporating "CAPITAL LETTERS" into its "Focus on Architecture" exhibit and workshop series this summer. Field trips are being conducted to three specially chosen historic homes. A learning game includes matching cards which show architectural details. Special talks are planned for groups to sign up for.

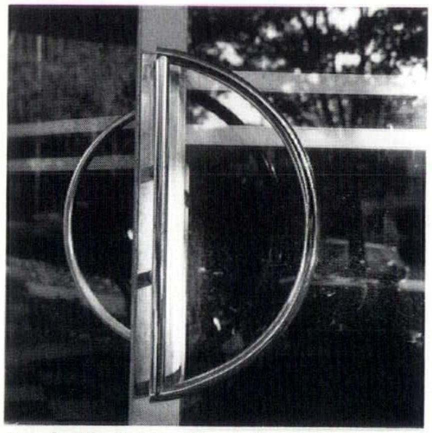
The alphabet pictures are attracting much attention at public libraries. It's infectuous.

This is indeed a project worth applauding. The children attracted by these posters will be the citizens deciding on our streetscapes in the near future.

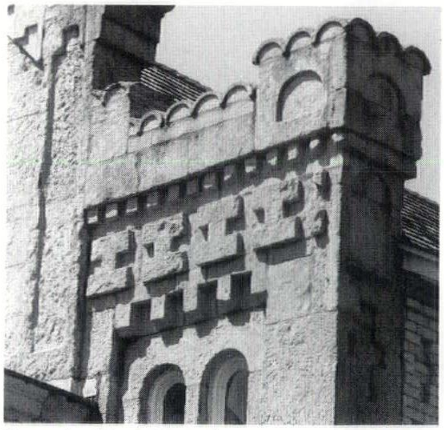
Photography: Jeff Dean



Window lobes, St. Norbert's Catholic Church
Roxbury
Romanesque Revival, 1866

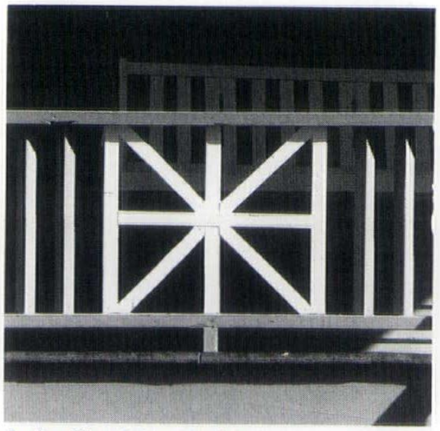


Door handle, Quisling Towers Apartments
1 East Gilman Street, Madison
Art Moderne, 1938

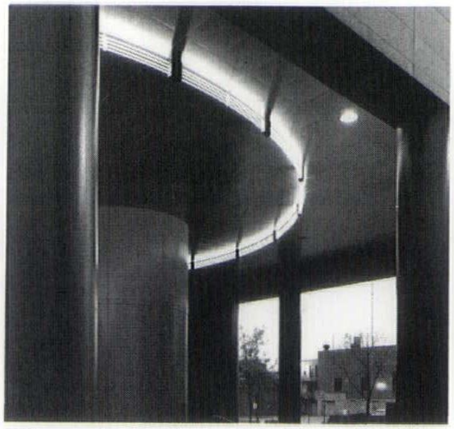


Decorative frieze, Gates of Heaven Synagogue
300 East Gorham Street, Madison
German Romanesque Revival, 1863

Shutter brace, Log House
Little Norway, Blue Mounds



Porch railing, Private Residence
266 East Washington Street, Stoughton



Column and neon sculpture, United States Courthouse
120 North Henry Street, Madison
Designed by Kenton Peters, 1984
Sculpture by Christopher Sproat

QBS

The Wisconsin Society of Architects has recently held several QBS round table sessions with members around the state to evaluate the Qualification Based Selection Program.

If you would like to receive a copy of the documented conclusions resulting from these meetings, or would like to share your thoughts with us regarding the QBS Program, contact Darius Van Fossen, WSA QBS Facilitator.

Call 608-257-8477 or drop a note to the WSA office, 321 S. Hamilton St., Madison, WI 53703.

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Wood Truss Plans

Richard Meyer, Director of the Office of Division Codes and Application at DILHR, recently issued an official code interpretation regarding plan submittals for wood truss structural components in buildings containing more than 50,000 cubic feet. Both the Architects Section and Engineers Section of the Joint Board ruled last year that certain wood truss plan submittals needed to be signed and sealed by a registered architect or professional engineer (*Wisconsin Architect*, October 1988). New language is also being considered regarding this issue as part of DILHR's Building Code update for 1990.

The following is the interpretation of Section ILHR 50.07(2)(a) & 50.12 (4)(a)2 issued in January, 1989:

Question:
When must wood truss structural component or erection plans be prepared by a Wisconsin registered architect or engineer and when must those plans be signed and sealed?

Answer:

1. Building plans, including the structional information specified in s. ILHR 50.12(4)(a)1. must be submitted for review and approval. If the structural information pertaining to the wood trusses (including bearing details, spacing, configuration, etc.) is not shown on the building plans, such information must be submitted with the wood truss structural component submittal.

2. Individual wood truss designs prepared by a truss plate manufacturer require a Wisconsin (A-E) seal or out-of-state seal with certificate per section ILHR 50.08.

3. The wood truss erection plans prepared by the truss fabricator to show location and designation of the trusses is a shop drawing that does not require the seal of a registered professional *if the plan is for identification/erection purposes only and the plan depicts information shown on the original building plans.*

4. Submission of wood truss erection plans prepared by the truss fabricator with a SB-118 form signed by the supervising professional is an indication that the truss framing plans have been reviewed for compliance with the general design concept by the responsible registered design professional and are not required to be signed and sealed.

Proposed new language being considered as part of the Building Code update would create Section ILHR 50.12(4)(a)3 as follows:

"For the purposes of this paragraph, the department does not consider truss layout plans or truss erection plans as architectural practice or engineering practice, and therefore, such plans do not require to be signed and sealed or stamped in accordance with ss. ILHR 50.07 or 51.08."

WAF Scholarships

The Wisconsin Architects Foundation (WAF) is completing its 35th year of contributing to the educational development of architecture in Wisconsin. During this period of time, the WAF has contributed more than $140,000 to over 160 individual students and to programs sponsored by local student chapters.

The following students at the University of Wisconsin-Milwaukee School of Architecture and Urban Planning received WAF scholarships in 1988-89: Christopher Kantak, Andre Brunfield, Fred Nicora, Bruce Roth, Jeffrey Mussen, Dan Morgan and David Plank. These students received scholarships ranging from $500 to $1,500 based on their academic record and financial need. In addition, the WAF Board of Directors approved a $500 scholarship for Tom Krizmanic of Middleton, Wisconsin who is attending The Catholic University of America in Washington, D.C.

Through your continued support and participation, the WAF is able to help build a better Wisconsin through architectural education.

Small Business Liaison

Of the 100,000 employers in Wisconsin, 90,000 are small employers. Of these, 50,000 have five employees or less. Because small employers have limited resources to work out Unemployment Compensation problems with state government, a Small Business Liaison office has been created in the UC Division at DILHR. For information and assistance, contact Joan D. McArthur at (608) 267-6787.

People & Places

William E. Dye, AIA, Middleton, has been accepted as an Emeritus Member of the American Institute of Architects. Congratulations!

Patrick Prendergast, AIA, John Miceli, AIA, and Raymond Sachs, AIA, have been named principals of Herbst Eppstein & Chadek, Inc., according to firm president Samuel Eppstein, AIA. All three new principals have served as project managers on projects by the Milwaukee-based firm.

Plunkett Keymar Reginato (PKR) Architects has awarded its first annual scholarship in memory of the firm's founder, Albert F. Keymar, to Jeffrey C. Spencer. Spencer will begin work this fall on his Master of Architecture degree at UWM SARUP. The scholarship/employment program will provide a $1,000 grant and an intern position with PKR Architects each year to outstanding students in the field of architecture.

Jeffrey C. Spencer & James Plunkett, AIA

Tavarez & Associates Architects, Inc., has a new address in Madison. It is 2740 Ski Lane, Madison, Wisconsin 53713, phone: (608) 271-1625.

Charles Quagliana, AIA, Madison, has been appointed by Governor Tommy Thompson to the State Historic Preservation Review Board. The duties of the 15-member Board include review and approval of nominations to the State and National Registers of Historic Places and approval of the distribution of federal subgrant funds for preservation projects.

Membership Action

Gatzke, Lori, was approved for Student Membership in the Northeast Wisconsin Chapter.

Slack, Barbara, was approved for Professional Affiliate Membership in the Southwest Wisconsin Chapter.

Bast, Richard J., was approved for AIA Membership in the Northeast Wisconsin Chapter.

Krause, Dan W., was approved for AIA Membership in the Northeast Wisconsin Chapter.

Leimer, Jay K., was approved for AIA Membership in the Northeast Wisconsin Chapter.

Nelsen, Dale H., was approved for AIA Membership in the Northeast Wisconsin Chapter.

Olson, Thomas G., was approved for AIA Membership in the Northeast Wisconsin Chapter.

Torine, Michael D., was approved for AIA Membership in the Southeast Wisconsin Chapter.

Broich, Kevin was approved for AIA Membership in the Southeast Wisconsin Chapter.

VandenKieboom, Jan J. was approved for AIA Membership in the Southeast Wisconsin Chapter.

Stanislaus, Michael D., was approved for Associate Membership in the Northwest Wisconsin Chapter.

Slominski, Paul, was approved for AIA Membership in the Southeast Wisconsin Chapter.

Bichler, Lynn, was approved for AIA Membership in the Southeast Wisconsin Chapter. Advanced to AIA from Associate.

Schmitt, Patrick, was approved for AIA Membership in the Southwest Wisconsin Chapter. Advanced to AIA from Associate.

Zahrt, Ronald, was approved for AIA Membership in the Southwest Wisconsin Chapter.

Lynch, Bruce E., was approved for AIA Membership in the Southeast Wisconsin Chapter. Advanced to AIA from Associate.

The following were approved for Student Membership:

John Richart, Southeast Chapter
Michael Cain, Southeast Chapter
Paul Perez, Southeast Chapter
Craig Wilson, Southeast Chapter
Ed Spitzer, Southeast Chapter
Mark Wessel, Southeast Chapter
Brian Meurstedt, Southeast Chapter
Reginald Wright, Southeast Chapter
Jillian Gerdin, Southwest Chapter
Kevin Ferguson, Southwest Chapter
Michael Thole, Southwest Chapter
Susan Decker, Southwest Chapter

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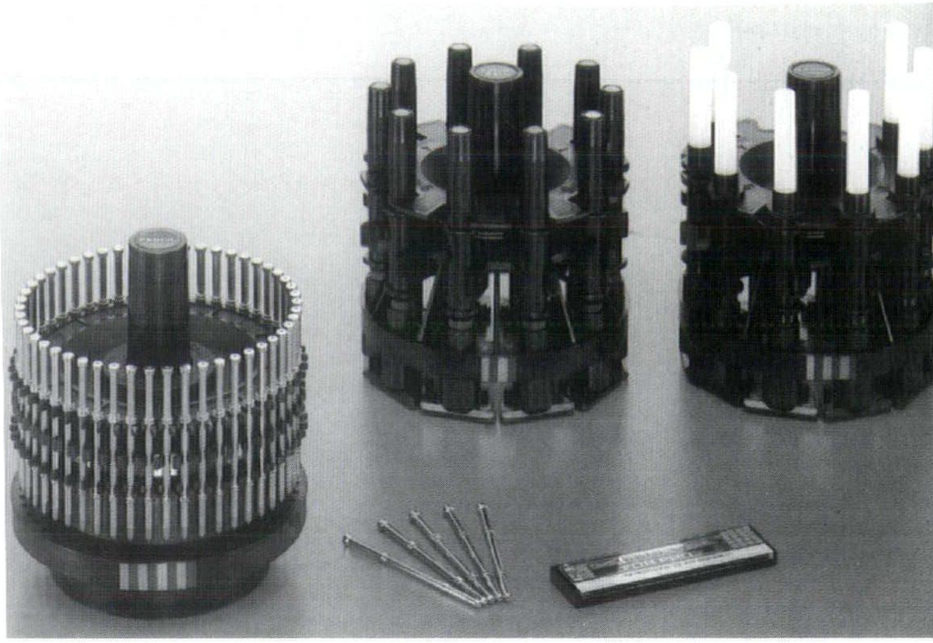

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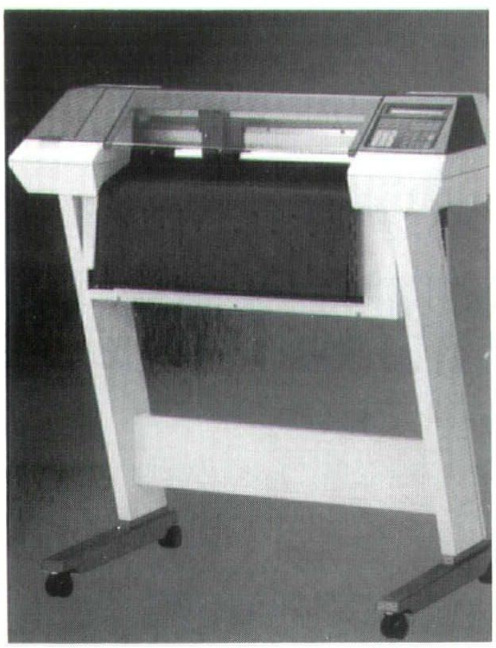

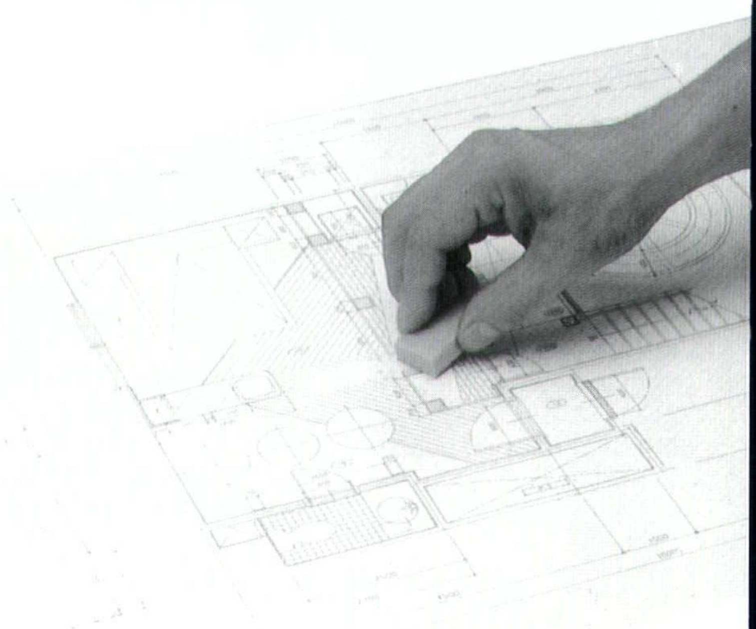

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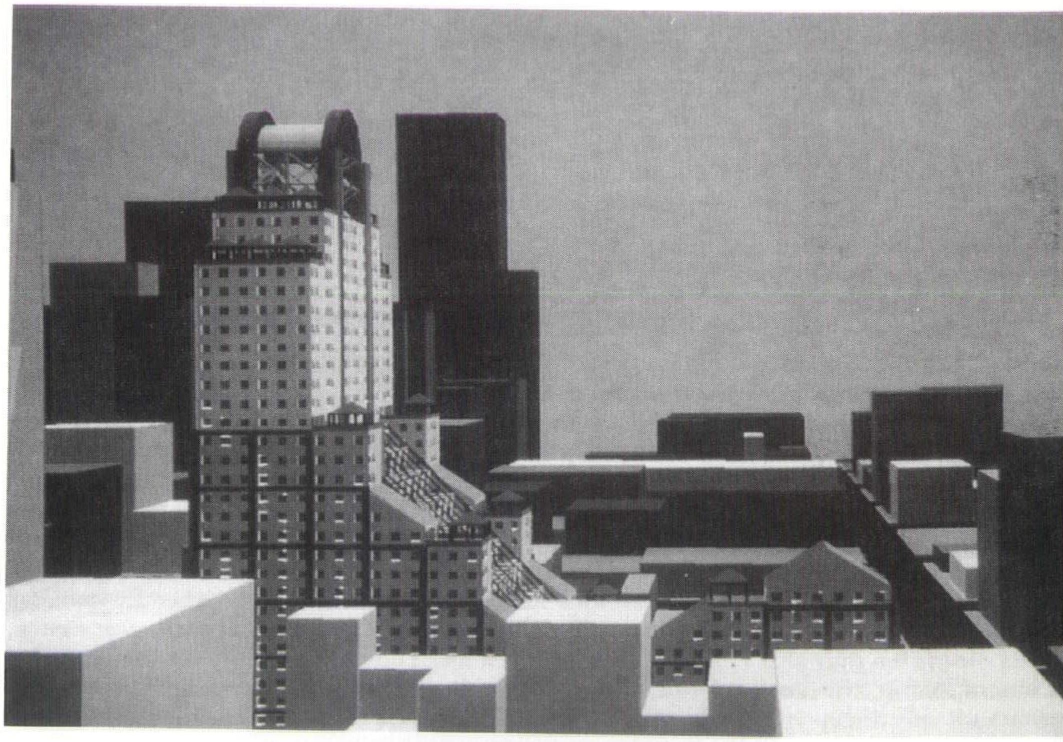

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ARRIS allows your project teams to share data, drawings and systems--so they can work on entire projects, not just single drawings. Plus, ARRIS will grow as you grow, so you keep your competitive edge.

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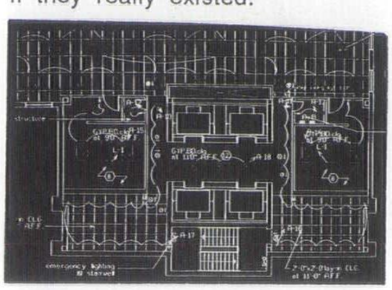

Production--Design automation, design refinement and 3-D capability increases your productivity

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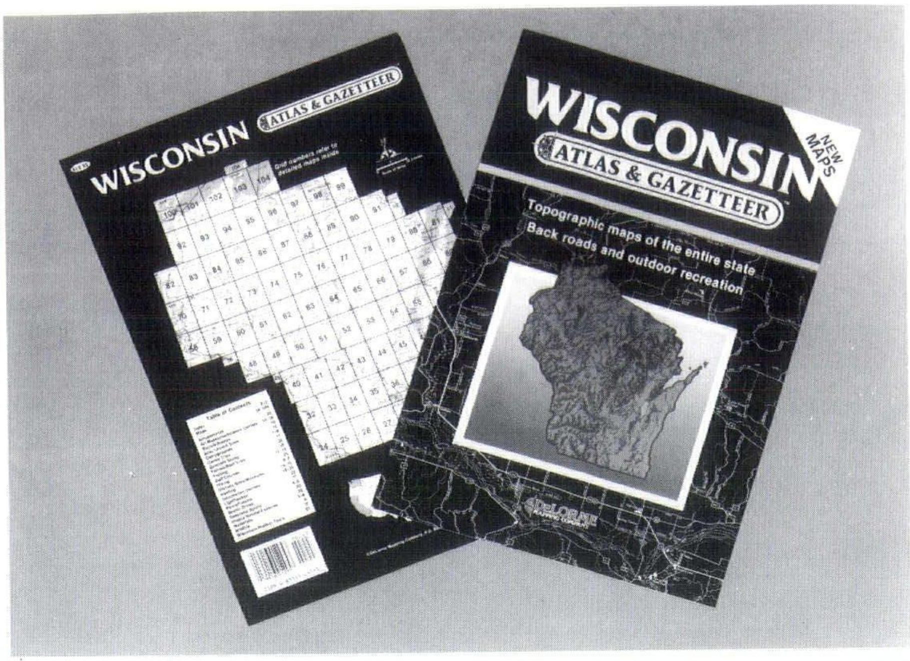
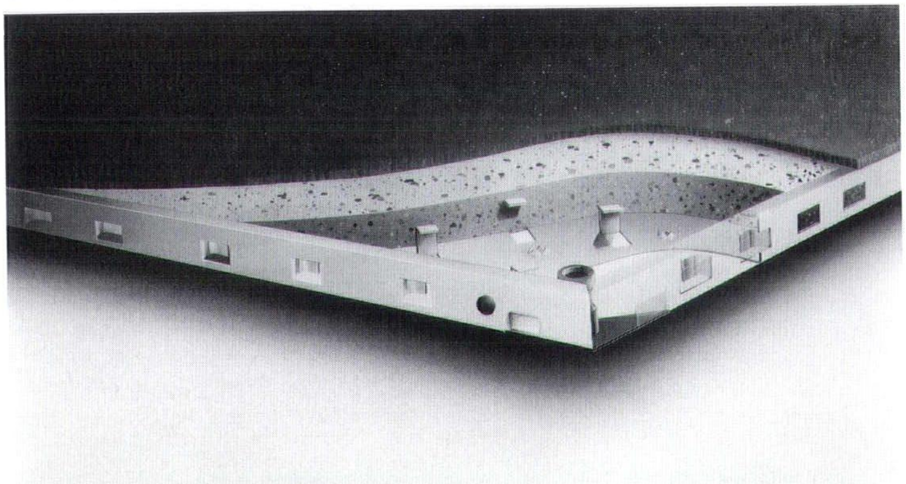


For the first time ever, there is a complete collection of up-to-date, full-color topographic maps covering the entire state of Wisconsin, all in one essay-to-use book. The **Wiscon Atlas & Gazetteer** is published by DeLorme Mapping of Freeport, Maine. It contains 81 pages of maps, plus over 1,500 recreational listings in 22 different categories.

The maps are at an unusually large scale of 1″ to 2.3 miles. If all the maps were joined, they would measure 11 feet square.

Other features include forests, wetlands, dams waterfalls, boat ramps (over 2800), railroads, powerlines and much more. Elevation contours accurately define the lay of the land, and boundary lines are shown for the range and township system, and for towns and counties as well as state parks and hunting lands.

For additional information, contact DeLorme Mapping, P.O. BOx 298-6103, Freeport, ME, 04032; (800)227-1656, ext. 6103.



A new computer-based cost-analysis program, available at no charge through C-TEC representatives, accurately compares installation and maintenance costs of access flooring, cellular floor, floor trench, core drill and flat wire cable management systems. The new software program, called Access, enables architects, building owners and facilities managers to determine the lowest cost system for specific buildings. The free Access report is generated from building and localized construction data compiled by C-Tec representatives in interviews with architects, building owners and facility managers.

The Access™ wire management analysis itemizes materials, installation labor and actual costs of the wiring and cabling. It also compares tax savings from regular and accelerated depreciation schedules and takes into account personnel churn costs over the lifetime of the equipment. Other cost comparisons include lease vs. buy options and a cost evaluation of systems furniture utilization with or without wiring and cabling capabilities.

For further information, contact Dan Meulenberg, C-TEC, INC., 3433 Lousma Dr., S.E., Grand Rapids, MI 49508-0956 616-243-2211.

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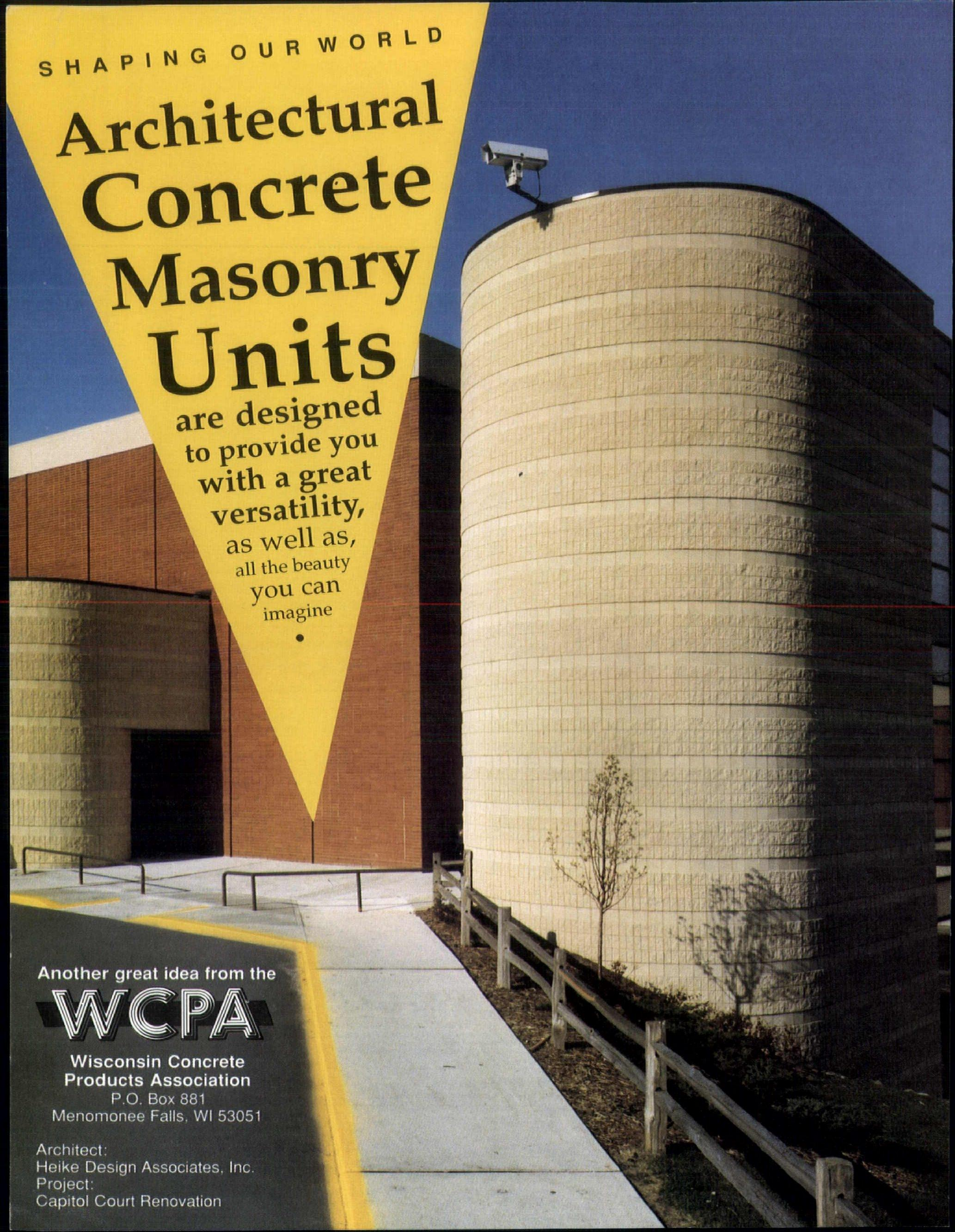
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